

1. Colloidal system of ceramic nanoparticles in a dispersion medium, comprising nanoparticles of zirconium dioxide, aluminum oxide, iron oxide or barium titanate which are enriched in volume percentages of 1% to 60% in the dispersion medium, wherein the nanoparticles are dispersed in the dispersion medium in a particle size range of 1nm to 100nm, characterized in that the nanoparticles are dispersed substantially to primary particle size in the dispersion medium, 90% or more than 90% of the nanoparticles distributed in the dispersion medium have a coinciding particle size, wherein the particle size variation decreases from 50%, related to nanoparticles of 1nm, to 10% for nanoparticles of 100nm, and the atoms and/or ions located in the surface of the nanoparticles are saturated in terms of valence in dependence on the concentration of the nanoparticles in the dispersion medium using a surface modifier such that an energetic balance of the nanoparticles in the dispersion medium is obtained.
2. Colloidal system according to claim 1, characterized in that an inorganic acid, such as HCl and/or a betadiketone and/or isocyanate, and/or an organic acid such as  $C_2H_4O_2$  and/or acid chlorides and/or acid ester and/or silanes and/or a polyoxycarboxylic acid are added to the dispersion medium as surface modifier.
3. Colloidal system according to claim 1 or 2, characterized in that the dispersion medium is  $H_2O$ , alcohol, tetrahydrofuran and/or a halogenated hydrocarbon and/or a diluted acid and/or a diluted lye and/or a hydrocarbon and/or an aromatic hydrocarbon.
4. Use of the colloidal system according to any one of the claims 1 through 3 as improving component for ceramic components, plastic materials etc, as filler for thermal insulation or sound insulation etc.
5. Use of the colloidal system according to any one of the claims 1 through 3 as gas sensor or as a component of a gas sensor.

6. Use of the colloidal system according to any one of the claims 1 through 3 as ceramic hollow fiber or as component of a ceramic hollow fiber.

7. Use of the colloidal system according to any one of the claims 1 through 3 as nano-filtration diaphragm or as component of a nano-filtration diaphragm.